

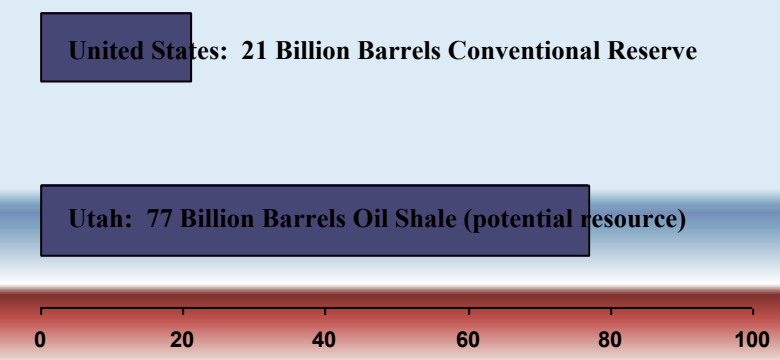
Unconventional Energy in Utah

A Path Towards Energy Independence

QUICK FACTS

- Utah is home to world-class unconventional energy resources.
- In-place oil shale resources in Utah, Wyoming, and Colorado are estimated to be more than the proven 'conventional' oil reserves in the Middle East.
- Utah has the largest oil sands resources in the United States.
- **Utah is poised to be a technology showcase** in unconventional energy.

Estimated Oil Reserves: Utah Shale vs. National



"Oil Shale has the potential to be one of our nation's greatest untapped resources"

-Governor Herbert

"Newer, cleaner technologies have been developed to produce liquid transportation fuels from... unconventional resources"

-Governor Herbert

Resource Brief: Oil Shale

What is oil shale?

Oil shale is a sedimentary rock that contains abundant organic material (kerogen) that, once heated, converts into oil and natural gas. Similar to 'conventional' oil, shale derived oil can be refined into gasoline and diesel fuels.

Why would we develop it?

Oil shale represents a path towards U.S. energy independence, while responsible development could create jobs, increase our energy security, and strengthen our economy.

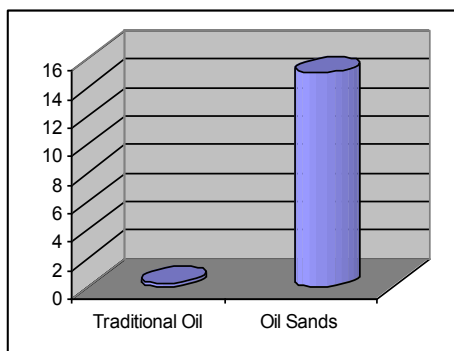
Why now? Hasn't oil shale been around forever?

The benefits of developing oil shale have been known for decades and it has been 'just over the horizon' for just as long. However, recent technological innovation – based right here in Utah – has given promise to economic and responsible development of this important resource. Promising new technology, high crude oil prices, and Governor Herbert's renewed emphasis on energy security and independence suggests Utah re-examine its oil shale resources.



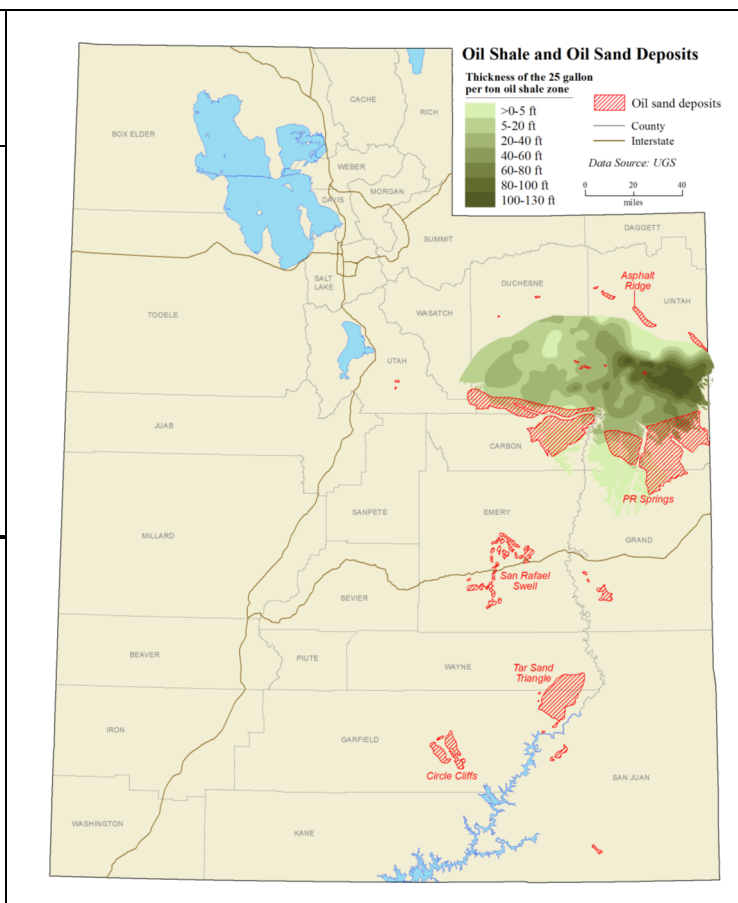
Photo: UGS

Utah's Conventional Crude Oil Reserve vs. Oil Sand Resource (billion barrels)



Oil Sands

- Oil sands are a mixture of sand and tar-like bitumen.
- Oil sands can be mined and upgraded into crude oil.
- Utah's oil sands contain 14-15 billion barrels of measured in-place oil, the most in the United States.
- Oil sands can be used for transportation fuels (gasoline/diesel) after extraction and upgrading or as natural asphalt.
- Utah's most economically perspective oil sand areas are the Asphalt Ridge and PR Springs deposits in the Uinta Basin.



Nuclear

- Uranium has been mined for over 100 years in Utah.
- Uranium mining ceased in the 1990's but was re-started in 2006 by mine operator Reliance Resources, LLC.
- Denison Minerals' White Mesa Uranium Mill in San Juan County produced 1.2 million pounds of uranium yellowcake in 2010 (23% of US national production).
- Westinghouse –a major manufacturer for the nuclear industry– produces zirconium products for commercial nuclear applications in Ogden.